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☐	L15	l1 with l2 with l8	1134
☐	L14	l1 and l2 and l8	54907
☐	L13	l1 and l2 and l4 and solution and l8	2
☐	L12	l1 same l2 same l4	1
☐	L11	l1 same l2 same l6	6
☐	L10	l1 with l2 with l6	3
☐	L9	sonic$	97686
☐	L8	L7 or alcohol$	609688
☐	L7	immisible	232
☐	L6	(hetrogeneous or dissimilar or different) with (nucleation site)	159
☐	L5	hetrogeneous or dissimilar or (different nucleation site)	51810
☐	L4	hetrogeneous	99
☐	L3	hetrogeneous nucleation	0
☐	L2	semiconductor or wafer or (semiconductor wafer) or (semiconductor device)	696796
☐	L1	(clean$ or process$ or treat$)	3831162

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☐ 1. Document ID: US 6848455 B1

L16: Entry 1 of 2 File: USPT Feb 1, 2005

US-PAT-NO: 6848455
DOCUMENT-IDENTIFIER: US 6848455 B1

TITLE: Method and apparatus for removing photoresist and post-etch residue from semiconductor substrates by in-situ generation of oxidizing species

DATE-ISSUED: February 1, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Shrinivasan; Krishnan	San Jose	CA		
Tipton; Adrianne	Fremont	CA		

US-CL-CURRENT: 134/1.3; 134/137, 134/149, 134/153, 134/184, 134/31, 134/33, 134/36, 134/902, 438/906

ABSTRACT:

Contaminants are removed from a semiconductor wafer by the in-situ generation of oxidizing species. These active species are generated by the simultaneous application of ultra-violet radiation and chemicals containing oxidants such as hydrogen peroxide and dissolved ozone. Ultrasonic or megasonic agitation is employed to facilitate removal. Radicals are generated in-situ, thus generating them close to the semiconductor substrate. The process chamber has a means of introducing both gaseous and liquid reagents, through a gas inlet, and a liquid inlet. O.sub.2, O.sub.3, and H.sub.2 O vapor gases are introduced through the gas inlet. H.sub.2 O and H.sub.2 O.sub.2 liquids are introduced through the liquid inlet. Other liquids such as ammonium hydroxide (NH.sub.4 OH), hydrochloric acid (HCI), hydrofluoric acid (HF), and the like, may be introduced to further constitute those elements of the traditional RCA clean. The chemicals are premixed in a desired ration and to a predetermined level of dilution prior to being introduced into the chamber. The chamber is equipped with megasonic or ultrasonic transducer probe(s), placed in close proximity to the substrate as the substrate rotates with the rotating platen.

28 Claims, 10 Drawing figures
Exemplary Claim Number: 22
Number of Drawing Sheets: 7

Full | Title | Citation | Front | Review | Classification | Date | Reference | | | Claims | KWIC | Draw De

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☐ 2. Document ID: US 5821175 A

L16: Entry 2 of 2 File: USPT Oct 13, 1998

US-PAT-NO: 5821175
DOCUMENT-IDENTIFIER: US 5821175 A

TITLE: Removal of surface contaminants by irradiation using various methods to achieve desired inert gas flow over treated surface

DATE-ISSUED: October 13, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Engelsberg; Audrey C.	Milton	VT		

US-CL-CURRENT: 438/795; 134/1, 134/1.3, 257/E21.226, 257/E21.295, 257/E21.3, 257/E21.58, 438/906

ABSTRACT:

An apparatus and method for removing surface contaminants from a surface of a substrate provides a laminar flow of inert gas over the substrate surface while irradiating the substrate. The invention enables removal of surface contaminants without altering the underlying molecular crystal structure of the substrate. The source of high-energy irradiation includes a pulsed or continuous wave laser or high-energy lamp.

9 Claims, 44 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 28

Full | Title | Citation | Front | Review | Classification | Date | Reference | [illegible] | [illegible] | Claims | KWIC | Draw. De

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